

## **DETAILED ACTION**

### **Response to Amendments**

No claims have been amended.  
Claims 1-27 are pending.

### **Per Examiner's Amendment**

Claims 1, 15, 17, 21, 22 and 27 are amended.

Claims 2, 6, 16 and 20 have been canceled.

Specification pages 7 and 8 have been amended (deleted hypertext).  
Abstract has been amended (shortened to 150 words or less).

Claims 1, 3-5, 7-15, 17-19 and 21-27 are allowed.

### **Response to Arguments**

**I.** Applicant's arguments (see Remarks filed 10/1/2009) with respect to Claims 1-27 have been fully considered and are persuasive. The rejections of the pending claims have therefore been withdrawn.

### **Examiner's Amendment**

**II.** An Examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

**III.** Authorization for this Examiner's amendment was given in a telephone interview with Atty. Richard Gregson on December 15, 2009 and April 26, 2010. Please make the following change to the claims listed below:

**Claim 1 (Amended):** A virtual data center implemented on hardware resources of at least one host computer having at least one host processor and system resources including memory divided into most privileged system memory and less privileged user memory, the virtual data center comprising:

virtualization software loaded on each host computer, said virtualization software operating in said less privileged user memory and dividing the host computer into a plurality of virtual partitions including at least one user guest partition and at least one system partition, said at least one user guest partition providing a virtualization environment for at least one guest operating system, and said at least one system partition maintaining a resource database for use in managing use of said at least one host processor and said system resources;

at least one monitor that operates in said most privileged system memory and maintains guest applications in said at least one guest partition within memory space allocated by said at least one system partition to said at least one guest partition;

a context switch between said at least one monitor and said respective guest and system partitions for controlling multitask processing of software in said partitions on said at least one host processor; and

a software application that owns a configuration policy for said data center and tracks persistence for respective domains to which each partition of said at least one host computer is assigned by said at least one system partition;

wherein said at least one system partition comprises an ultravisor partition that includes said resource database and a resource management software application that assigns system resources to respective system and guest partitions and provides an index to the assigned system resource in said resource database, a command partition that owns a resource allocation policy for the host system on which it is loaded and that creates transactions that pass through a command memory channel between said command partition and said ultravisor partition for processing by said resource management software for reallocation of said system resources as specified in said transaction;

wherein upon activation of a partition, the software application selects a host computer of said at least one host computer having required resources for said activated partition, connects to a resource service running in a command partition of said host computer, and provides a definition of the activated partition and a start command to the resource service.

**Claim 15 (Amended):** A method of implementing a virtual data center on hardware resources of at least one host computer having at least one host processor and system resources, comprising the steps of:

dividing said at least one host computer into a plurality of virtual partitions including at least one user guest partition and at least one system partition, said at least one user guest partition providing a virtualization environment for at least one guest operating system, and said at least one system partition maintaining a resource database for use in managing use of said at least one host processor and said system resources;

maintaining guest applications in said at least one guest partition within memory space allocated by said at least one system partition to said least one guest partition;

providing a context switch between said respective guest and system partitions for controlling multitask processing of software in said partitions on said at least one host processor; and

assigning each partition to a domain of said at least one host processor in accordance with a configuration policy for said data center; and

tracking persistence for respective domains to which each partition of said at least one host computer is assigned by said at least one system partition;

wherein said at least one system partition comprises an ultravisor partition that includes said resource database and said resource management software application and a command partition that owns a resource allocation policy for said host system, further comprising the steps of creating transactions that pass through a command memory channel between said command partition and said ultravisor partition and said resource management software processing said transaction for reallocation of said system resources as specified in said transaction;

wherein upon activation of a partition, performing the steps of selecting a host computer of said at least one host computer having required resources for said activated partition, connecting to a resource service running in a command partition of said host computer, and providing a definition of the activated partition and a start command.

**Cancel: Claims 2, 6, 16 and 20.**

**Claim 3:** In line 1, replace “claim 2” with—*claim 1*—.

**Claim 7:** In line 1, replace “claim 6” with—*claim 1*—.

**Claim 17:** In line 1, replace “claim 16” with—*claim 15*—.

**Claim 21:** In line 1, replace “claim 20” with—*claim 15*—.

**Claim 22:** In line 1, replace “claim 16” with—*claim 15*—.

**Claim 27:** In line 1, replace “claim 16” with—*claim 15*—.

**Specification:**

- a. On page 7 paragraph 0034, in lines 2-4, DELETE  
“See <http://www.microsoft.com/windowsserver2003/technologies/management/ads/default.mspx> for details.”
- b. On page 7 paragraph 0037, in line 2, DELETE  
“See <http://www.webopedia.com/TERM/D/DMZ.html> for details.”
- c. On page 7 paragraph 0039, in lines 1-2, DELETE  
“For details, see <http://www.microsoft.com/windowsserversystem/dsi/dsiwp.mspx>.”
- d. On page 7 paragraph 0040, in lines 2-3, DELETE  
“For details, see <http://www.intel.com/technology/efi> and <http://www.intel.com/technology/framework/>.”
- e. On page 8 paragraph 0050, in lines 2-3, DELETE  
“For details, see <http://www.webopedia.com/TERM/P/PCI.html> and <http://www.pcisig.com/home>.”
- f. On page 8 paragraph 0052, in lines 1-2, DELETE  
“Interesting developments and relevant standards are described at <http://www.rdmaconsortium.org/home>.”
- g. On page 8 paragraph 0054, in lines 2-3, DELETE  
“For details, see <http://www.microsoft.com/windowsserversystem/dsi/sdm.mspx>.”
- h. On page 8 paragraph 0059, in lines 2-4, DELETE  
“For details, see <http://www.intel.com/pressroom/archive/releases/20030916corp.htm> and <http://www.xbitlabs.com/news/cpu/display/20030918034113.html>.”

**Please delete current Abstract and replace with the new Abstract below:**

**Abstract (New)** A virtualization infrastructure that allows multiple guest partitions to run within a host hardware partition. The host system is divided into distinct logical or virtual partitions and special infrastructure partitions are implemented to control resource management and to control physical I/O device drivers that are, in turn, used by operating systems in other distinct logical or virtual guest partitions. Host hardware resource management runs as a tracking application in a resource management “ultravisor” partition, while host resource management decisions are performed in a higher level command partition based on policies maintained in a separate operations partition. Host hardware I/O management is implemented in special redundant I/O partitions. Operating systems in other logical or virtual partitions communicate with the I/O partitions via memory channels established by the ultravisor partition.

#### **Reasons for Allowance**

The following is an Examiner's statement of reasons for allowance

IV. The prior art or record fails to teach neither singly nor in combination, the claimed limitations of: implementing a virtual data center on hardware resources of at least one host computer having at least one host processor and system resources, comprising the steps of: dividing said at least one host computer into a plurality of virtual partitions including at least one user guest partition and at least one system partition, said at least one user guest partition providing a virtualization environment for at least one guest operating system, and said at least one system partition maintaining a resource database for use in managing use of said at least one host processor and said system resources; maintaining guest applications in said at least one guest partition within memory space allocated by said at least one system partition to said least one guest partition; providing a context switch between said respective guest and system partitions for controlling multitask processing of software in said partitions on said at least one host processor; assigning each partition to a domain of said at least one host processor in accordance with a configuration policy for said data center; and tracking persistence for

respective domains to which each partition of said at least one host computer is assigned by said at least one system partition; wherein said at least one system partition comprises an ultravisor partition that includes said resource database and said resource management software application and a command partition that owns a resource allocation policy for said host system, further comprising the steps of creating transactions that pass through a command memory channel between said command partition and said ultravisor partition and said resource management software processing said transaction for reallocation of said system resources as specified in said transaction; wherein upon activation of a partition, performing the steps of selecting a host computer of said at least one host computer having required resources for said activated partition, connecting to a resource service running in a command partition of said host computer, and providing a definition of the activated partition and a start command. These limitations are expressed in independent claims 1 and 15, and are supported by Applicant's Specification (pages 3-5 paragraphs 008-0013; pages 9-25 paragraphs 0063-0125; pages 33-38 paragraphs 0166-0187).

Prior art references *Neiger et al* (7,424,709), (7035963) and (7,020,738), *Cota-Robles et al* (7,191,440) and *Bayeh* (6,223,202) disclose methods and techniques for loading and executing virtual machines on a host or server, divisioning into a hierarchy of privileged memory and applications portions, monitoring and distributing request based on the appropriate resources of the virtual machine. However the prior art fails to specifically teach or make obvious tracking persistence for respective domains to which each partition of said at least one host computer is assigned by said at least one system partition; wherein said at least one system partition comprises an ultravisor partition that includes said resource database and said resource management software application and a command partition that owns a resource allocation policy for said host system, further comprising the steps of creating transactions that pass through a command memory channel between said command partition and said ultravisor partition and said resource management software processing said transaction for reallocation of

said system resources as specified in said transaction; wherein upon activation of a partition, performing the steps of selecting a host computer of said at least one host computer having required resources for said activated partition, connecting to a resource service running in a command partition of said host computer, and providing a definition of the activated partition and a start command. These limitations, in conjunction with other limitations in the independent and dependent claims, are not specifically disclosed or remotely suggested in the prior art of record. A review of Claims 1, 3-5, 7-15, 17-19 and 21-27, in view of the Examiner's remarks above, indicates that these claims are allowable over the prior art.

Any comments considered necessary by Applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### **Conclusion**

V. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Kristie Shingles whose telephone number is 571-272-3888. The examiner can normally be reached on Monday-Friday 8:30-6:00pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, William Vaughn can be reached on 571-272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Kristie Shingles**  
Examiner  
Art Unit 2444

*/KDS/*

*/William C. Vaughn, Jr./*  
*Supervisory Patent Examiner, Art Unit 2444*